



## Module 7 Linkages to Treatment, Care, and Support for Mothers and Families With HIV Infection



**Total Time:** 150 minutes

### SESSION 1 Linkages with Local Treatment, Care, and Support Services for Mothers and Families

Activity/Method	Resources Needed	Time
Exercise 7.1: Community linkages: small group discussion	None, other than those noted below	70 minutes

### SESSION 2 Treatment, Care, and Support of the Mother who is HIV-Infected

Activity/Method	Resources Needed	Time
Exercise 7.2: Postpartum case study	None, other than those noted below	45 minutes

### SESSION 3 Treatment, Care, and Support of the Infant and Young Child Exposed to HIV

Activity/Method	Resources Needed	Time
Exercise 7.3: Clinical presentation of HIV in infants	Three cards, 4"x 6" or similar, with the following headings (one per card): GI, Pulmonary, Immune Function	35 minutes

#### Also have available the following:

- Overheads or PowerPoint slides for this Module (in Presentation Booklet)
- Overhead or LCD projector, extra extension cord/lead
- Flipchart or whiteboard and markers or blackboard and chalk
- Pencil or pen for each participant

## Relevant Policies for Inclusion in National Curriculum

### Session 1

- Listing of local agencies providing clinical and social support services for mothers and families with HIV

### Session 2

- Guidelines on postpartum care of the mother with HIV infection
- Guidelines on prevention and treatment of opportunistic infections such as PCP and TB
- National guidelines on HIV care and treatment for adults, including ARV treatment
- Any other national guidelines on treatment of symptoms and palliative care, nutritional support, and social and psychosocial support (If not included above)

### Session 3

- Guidelines for follow-up visits and immunisation schedule for the infant or child who is HIV-exposed
- Clinical guidelines on the care and treatment (including ARV treatment) of infants and children who are HIV-exposed or HIV-infected



The *Pocket Guide* contains a summary of each session in this module.

## SESSION 1 Linkages with Local Treatment, Care, and Support Services for Mothers and Families

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### Advance Preparation

No additional advance preparation is required for this session.



**Total Session Time:** 70 minutes

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### Trainer Instructions

**Slides 1 and 2**

Begin by reviewing the module objectives listed below.

#### After completing the module, the participant will be able to:

- Explain the treatment, care, and support needs of mothers with HIV infection and their infants who are HIV-exposed.
- Identify local supportive resources for mothers, children, and their families.
- Develop and strengthen linkages with treatment, care, and support services for women and children infected with or exposed to HIV.



### Trainer Instructions

**Slides 3 and 4**

Discuss the different kinds of linkages to care and support services that may help mothers and families, using the information below.



### Make These Points

- Strengthening linkages to existing support services provides continuity of care for mothers, infants, and families.
- Referral systems expand on services offered through MCH and PMTCT programmes.
- Community-based service organisations, including NGOs and faith based organisations, can address psychosocial as well as medical needs.
- Team building is essential to promoting community linkages.

The follow-up treatment, care, and support that women who are HIV-infected receive after delivery, and the care of their children and families, can be strengthened if linkages are made with comprehensive community health services that include HIV/AIDS treatment and care, social support, and patient advocacy. It is important that treatment and care extend beyond PMTCT prophylaxis for women, infants, and family members at risk for or infected with HIV.

### **Linkages can be fostered in many ways:**

- Programme developers can establish linkages by integrating PMTCT services into existing maternal and child health (MCH) services.
- Clinicians and healthcare workers can expand their practices to include necessary referrals and then follow up to ensure families have easy access to linked services.
- Community workers, including lay counsellors, can assist women in obtaining treatment, care, and support services.

### **Linkages between MCH and HIV services**

- MCH services are entry points for PMTCT and for the treatment, care, and support of women who are HIV-infected and their infants and other family members.
- PMTCT is integrated into MCH services through training (building human capacity) and programme development.
- Caring for and treating families affected by HIV is a shared responsibility.
- All children born to women who are HIV-infected require close follow up and appropriate care.
- Community MCH workers may be encouraged to provide information on health promotion and disease prevention, as well as care and support services to these families.
- Specialists in HIV who care for women and children may provide consultation, anti-retroviral treatment, and help with the ongoing management of HIV infection.

### **Linkages with other health programmes for special needs**

- Some programmes target specific health needs, such as family planning, treatment of sexually transmitted infections (STIs), or assistance with substance abuse.
- Disease-specific programmes, such as those for people with tuberculosis (TB) may benefit women who are HIV-infected. TB, which is highly prevalent in certain countries, is a leading cause of mortality in persons infected with HIV. (See Appendix 7-A.)
- Nutritional support programmes for mothers and children are especially important for people living with HIV/AIDS (PLWHA).

### **Linkages to community-based AIDS service organisations**

Linkages to community-based organisations can provide the resources to help women who are HIV-infected and their families cope with the isolation, social stigma, and emotional pressures that often accompany a diagnosis of HIV. They also may provide women infected with HIV a way to become involved in voluntary or paid HIV-related work.

- Non-governmental organisations (NGOs), faith-based organisations (FBOs), and similar agencies often provide treatment, care, and support services for mothers who are HIV-infected and family members.
- Linkages between healthcare programmes and other community based and faith-based organisations may improve patient care.
- Faith-based organisations and traditional healers may offer another important source of social and community support.
- Many community agencies may also provide education, counselling, and testing about HIV prevention and safer sex.
- Linkages to programmes for preventing and treating malaria or TB, or to programmes that offer nutritional support help women gain access to needed services.
- Relationships between health clinics and community programmes may offer connections to counselling, peer education support groups, and networks for PLWHA.
- Organisations of PLWHA are one of the most important sources of support for mothers diagnosed with HIV infection in PMTCT programmes and for their families.
- Community organisations often help PLWHA with specific needs such as housing, transportation, food assistance, legal assistance and advice, and income-generating activities.

#### **Building community teams for shared responsibility**

- Formalise connections among MCH programmes, health systems, and community programmes, whenever possible.
- As people who work in community agencies and healthcare settings learn more about services available outside of their own setting, people living with HIV/AIDS can gain access to a wider range of services.



### **Trainer Instructions**

Lead the small group discussion on community linkages.

<b>Exercise 7.1 Community linkages: small group discussion</b>	
<b>Purpose</b>	<p>Identify the range of services locally available to PLWHA.</p> <p>Encourage interagency networking and linkages.</p> <p>Facilitate client referral to community services.</p>
<b>Duration</b>	60 minutes
<b>Introduction</b>	<p>Once a healthcare worker recognises <i>when</i> to refer a patient to a local organisation offering needed services, the next step is to find out where to refer people. This exercise will provide participants a chance to share information on the continuum of HIV-related services offered in their community. By the end of this exercise all participants should have compiled a listing of HIV-related resources.</p>
<b>Activities</b>	<p>Using participant sign-up sheets, identify and divide participants by geographic location or association with a particular facility (not more than 4–5 groups if possible).</p> <p>Ensure each group has copies of Appendix 7-B Community resource information worksheet.</p> <p>Using Appendix 7-B as a guide, ask each small group to identify available community resources and record them on paper.</p> <p>Also using Appendix 7-B ask them to address each category of community resource in the left-hand column and answer the following questions:</p> <ul style="list-style-type: none"> <li>▪ Are they familiar with a resource for each listing? For example, do they know of a local support group or club for PLWHA?</li> <li>▪ Are they aware of the address, location, hours of operation?</li> <li>▪ For each resource listed, do they know of a contact person for networking and referral?</li> <li>▪ Are there resources missing in their list?</li> <li>▪ Can they think of other resources that are not included?</li> <li>▪ Are they in contact with key community members who they might partner with to expand their resource list?</li> </ul> <p>Allow 35–40 minutes for this process.</p> <p>Ask each group to assign a spokesperson who can report on the group's findings.</p> <p>List services on flipchart or blackboard as group spokesperson provides information.</p>
<b>Debriefing</b>	<p>Remind participants that establishing linkages requires community teamwork.</p> <p>Healthcare workers need to become familiar with local services, including physical location, hours of operation, what specific services are provided, and a contact name and telephone number for making referrals.</p>

## SESSION 2 Treatment, Care, and Support of the Mother with HIV Infection

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### Advance Preparation

Review Exercise 7.2: Postpartum case study to be sure it reflects local customs, issues, and policies. Ask local healthcare workers to help you adapt the exercise, if necessary. Change the names from "Bea" to a common local name.



**Total Session Time:** 45 minutes

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### Trainer Instructions

**Slides 5, 6 and 7**

Discuss the postpartum care of mothers who are HIV-infected, using the information below.



### Make These Points

- Postpartum care includes physical assessment, infant-feeding support, family planning, and referral for HIV/AIDS treatment.
- A mother's chosen feeding option will not always reflect national and regional policies.
- Condoms protect against both STIs—including HIV—as well as unintended future pregnancies.

## Postpartum care of the mother with HIV infection

Healthcare workers should ensure that women who are infected with HIV and have given birth in a healthcare facility return for postpartum appointments or are visited at home.

Women who have given birth at home should be evaluated 1 week after the birth and again at 6 weeks.

Include the following during visits:

### Assessment of healing

- Check wound healing.
- Monitor uterine involution.
- Confirm cessation of postpartum bleeding.

### Infant-feeding support

(Also see *Module 4, Infant Feeding in the Context of HIV Infection*.)

- Assess progress of infant feeding.
- Assist the mother to safely implement her chosen feeding option.
- Assess family support for the infant-feeding option.
- Work with the mother to develop a plan to address challenges.

### Sexual and reproductive care

(Also see *Module 2, Overview of HIV Prevention in Mothers, Infants, and Young Children*)

- Discuss condom use as dual protection (against STIs, including HIV, and for family planning).
- Support the mother's choice of contraceptive method.
- Discuss the importance of safer sex to prevent the spread of HIV and other STIs.
- Provide advice regarding early STI treatment, including symptom recognition and where to go for STI assessment and treatment.
- Answer any questions the woman may have about safer sex behaviours.



## Make These Points

- Providing linkages to supportive services for primary care—including HIV/AIDS care and psychosocial support—is a part of postpartum care.
- Discuss importance of linking patients to a range of support services, using the information below.



### **Related services for HIV treatment, care, and support**

*The postpartum period is an ideal time to link the woman who is HIV-infected to comprehensive care that will support her health, prevent complications, and improve her ability to live with HIV.*

A range of related services should be provided directly or by referral, including those listed below:

- Prevention and treatment of opportunistic infections
- ARV treatment when indicated and available
- Treatment of symptoms and palliative care
- Nutritional support
- Social and psychosocial support
- Faith-based support
- Home-based care



### **Trainer Instructions**

#### **Slides 8 and 9**

Discuss prevention and treatment of opportunistic infections, using the information below.



### **Make These Points**

- Refer participants to national and regional guidelines for managing opportunistic infections such as PCP.
- Cotrimoxazole, though commonly used for bacterial and PCP prophylaxis, is not well-tolerated by everyone. Should an adverse reaction occur, another drug may be substituted according to national or local protocol.
- Discuss prevention and treatment of other opportunistic infections in mothers who are HIV-infected, using the information below.
- When presenting TB information, keep in mind that women who have received BCG and women who have had a positive skin test should not receive an annual skin test.

### **Prevention and treatment of opportunistic infections**

Infections are a major complication of HIV. Preventing opportunistic and other infections will help a woman stay healthier and preserve her immune system.

### **Prevention and treatment of malaria**

Recommend the use of insecticide-treated bed nets to prevent malaria in areas where it is endemic. Offer malaria treatment and prophylaxis according to national guidelines.

### ***Pneumocystis carinii* pneumonia prophylaxis**

WHO recommends the use of cotrimoxazole to help prevent *pneumocystis carinii* pneumonia (PCP) in adults who meet any one of several criteria listed in Appendix 7-C. Cotrimoxazole also may reduce the risk of other bacterial infections and toxoplasmosis.

### **Prophylaxis, screening, and treatment for TB**

An estimated 40% of persons who are HIV-infected will develop TB in their lifetime. Refer to country protocols regarding prophylaxis, screening, and treatment of TB, particularly in high prevalence areas. (See Appendix 7-A for recommendations.)

### **Immunisations**

Recommendations for immunisations should follow national and WHO guidelines for adults who are HIV-infected.



### **Trainer Instructions**

#### **Slide 10**

Discuss ARV treatment to reduce the risk of MTCT, using the information below.



### **Make These Points**

- ARV prophylaxis does not provide long-term protection from MTCT or treat maternal HIV.
- Referral for combination antiretroviral treatment is important for both mother and infant, especially those who are breastfeeding.

### **Antiretroviral treatment**

Although ARV prophylaxis during pregnancy reduces the risk of MTCT, it does not provide any long-term benefit to the mother. When indicated, (ie, when the patient meets clinical criteria to start antiretroviral treatment) antiretroviral treatment to suppress viral replication and promote a better quality of life is needed.

### **Antiretroviral treatment**

Support for antiretroviral treatment for women who are HIV-infected is becoming increasingly available. Women initially followed in PMTCT settings should be linked to treatment services for themselves and their families (PMTCT-Plus). International and national policies and guidelines provide support for this process including criteria for initiating treatment. See Appendix 3-B for WHO recommendations.

Combining ARV drugs to reduce the HIV viral load as much as possible—and for as long as possible—is the standard of care for HIV treatment. A combination of three or more ARV drugs, referred to as highly active antiretroviral therapy (HAART), slows replication of HIV.

The advantages are

- Improved health status
- Decreased MTCT rates
- Reduced HIV-related hospitalisations
- Reduction in number of deaths from AIDS

A high level of patient adherence to ARV treatment and care regimens may reduce drug resistance and ensure better efficacy. Creative strategies to help patients achieve optimal adherence are essential components of successful HIV/AIDS treatment programmes. Consider the following methods:

- Provide education and establish patient readiness prior to initiating treatment.
- Recognise that immediately postpartum, women will require additional support.
- Consider the use of practical adherence tools such as pill boxes, and written instructions.
- Explore patient's daily meal patterns, work schedule, and sleep patterns to find the best time to take medications.
- Develop culturally appropriate strategies to overcome barriers and support adherence when possible.



### **Trainer Instructions**

#### **Slide 11**

Discuss palliative care, using the information below.



### **Make These Points**

- Introduce and then discuss symptom treatment and palliative care for mothers who are HIV-infected, using the information on the following page.

### **Treatment of symptoms and palliative care**

PLWHA are subject to HIV symptoms that can limit participation in family and community activities. Healthcare interventions that focus on managing symptoms and relieving discomfort can improve a woman's quality of life. Simple management of common HIV symptoms, such as nausea, vomiting, fatigue and skin problems can ease discomfort. Assessment and management of more complex issues such as pain, weight loss and wasting resulting from disease progression can improve comfort, function and emotional well-being.

#### **Palliative care is patient and family-centred care that:**

- Provides access to information and honours a person's choices
- Optimises quality of life
- Anticipates, prevents, and treats suffering
- Addresses physical, emotional, social, and spiritual needs



### **Trainer Instructions**

#### **Slide 12**

Discuss nutritional counselling and support, using the information below.



### **Make These Points**

- Emphasise that women who are HIV-infected and are exclusively breastfeeding require an additional 500 kcal/day.

### **Nutritional counselling, care, and support**

Often, people with HIV infection or AIDS have symptoms that make food preparation and eating difficult. Appendix 7-D lists some of the symptoms of HIV/AIDS and ways in which people may reduce or overcome those symptoms while maintaining adequate nutrition.

Women receiving HIV-related medications require counselling on specific dietary practices and nutritional needs, in order to successfully manage side effects and avoid nutrition-related complications. Antenatal counselling for safer infant-feeding practices and postnatal support for the feeding option a woman selects may help ensure adequate nutrition and the proper growth and development of her child.

PLWHA are especially vulnerable to bacterial infections because their immune systems become weakened. Emphasise to PLWHA the importance of cleanliness during food preparation and storage.

Adequate nutrition, exercise, rest, good hygiene practices, and abstinence from harmful habits such as smoking, alcohol, and drug abuse support overall health and improve immune function.



## Trainer Instructions

### Slide 13

Using the information below, discuss social and psychosocial support for mothers who are HIV-infected, including faith-based support.

#### **Social and psychosocial support**

Because people with HIV face stigma in many communities (See *Module 5, Stigma and Discrimination Related to MTCT*), women who are HIV-infected often are reluctant to disclose their serostatus to partners, family, or friends. Moreover, a woman who has learned of her HIV serostatus during prenatal HIV testing may still be adjusting to her diagnosis. Regular monitoring of mental health and psychosocial care and support are critical at all stages of HIV infection. The following services should be offered directly or by referral:

- Support to help the woman come to terms with her diagnosis
- Psychosocial support for the mother and for the infant who is exposed to HIV in cases when the infant's HIV status is uncertain and when a positive diagnosis is made
- Community support, including referrals to community-based and faith-based programmes
- Peer group counselling and support from health agencies or NGOs
- Support and counselling to assist women who are HIV-infected and their partners with disclosure issues

#### **Faith-based support**

Faith-based involvement provides mothers who are HIV-infected with spiritual and psychosocial support. It also may provide them with an important sense of belonging to a larger community that offers them compassionate care. In many programmes, faith-based organisations are providing comprehensive treatment, care, and support services.

#### **Home-based care**

In many resource-limited settings, home-based care provides services to PLWHA when hospital and outpatient services are expensive or not accessible. The advantages of home-based care for patients and families, and for communities and the healthcare system include:

- Care is provided in a familiar, supportive environment that allows for continued participation in family matters
- Medical expenses are reduced
- The local community is involved in caring for PLWHA, which may help counter myths and misconceptions
- The burden on the healthcare system is eased

Healthcare workers may offer direct psychosocial support and referrals to community resources. AIDS service organisations in the community may provide social support through peer group counselling, clubs, or referrals to other services.



## Trainer Instructions

Lead Exercise 7.2, a case study addressing postpartum issues.

Exercise 7.2: Postpartum case study	
<b>Purpose</b>	To prepare participants to handle common problems that mothers may present during postpartum visits.
<b>Duration</b>	30 minutes
<b>Introduction</b>	<p>Distribute copies of the postpartum case study.</p> <p>Explain to participants that the case study will help them evaluate and make recommendations for addressing common problems that may arise at postpartum checkups.</p>
<b>Activity</b>	<ul style="list-style-type: none"><li>▪ Ask participants to divide into three groups.</li><li>▪ Instruct them to read through the case study together.</li><li>▪ Ask each group to assign one person (the group recorder) to write down key issues in the case study.</li><li>▪ Ask each group to list each issue that the healthcare worker needs to address.</li><li>▪ Tell participants that the groups have 15 minutes to discuss and develop strategies to resolve the issues on their lists.</li><li>▪ Ask the group recorder to write down the strategies for each issue.</li><li>▪ Ask each group to tell you the key issues discussed. Write these on a flipchart in the front of the room—on the left side of the paper; leave the right-hand column for recording strategies.</li></ul>
<b>Debriefing</b>	<p>Ask group: did they feel that this case study was appropriate for discussing a postnatal visit?</p> <p>What other issues typically come up?</p> <p>Women who are HIV-infected often require special consideration for both treatment and emotional support.</p> <p>Consider referral for ARV treatment as resources and national policies allow.</p>

## Case study

Bea is a 24-year-old woman who was diagnosed as HIV-infected during her recent pregnancy. She and her infant received the appropriate medication to prevent MTCT, as recommended by the country programme. She has returned for her 6-week follow-up visit.

Bea has chosen to exclusively breastfeed. She feels, however, that the baby is always hungry and is wondering if her breastmilk is enough; she has also been giving him supplemental vitamins. Bea and her husband, who is also HIV-infected, would like to resume sexual relations. She has been told that she will not need to use protection because breastfeeding eliminates her chances of getting pregnant.

Upon examination, Bea appears to be doing well. She has a 0.3 cm fissure (crack) at the base of her right nipple. There is no observable redness, heat, or sign of infection. Bea reports that she has been feeling more tired than usual and has about half her normal energy, but does not have any other physical complaints. She wants to know whether starting HIV medicine may help her feel better.

Bea's husband has been sitting in the waiting room. He is currently unemployed. While Bea is getting dressed, he says, "I have always taken good care of my family, but now, without money coming in, I don't see how we are going to make it. I feel like God is punishing me, somehow, for infecting my wife with HIV."

*What are the important issues for Bea and her husband?*



## Trainer Instructions

In reviewing responses, be certain that the group addresses the following issues:

- 1) Bea will require a great deal of support for continuing with her choice of exclusive breastfeeding:
  - a) Review nutritional benefits of breastfeeding and check the supplemental vitamins she is giving to her infant.
  - b) Find out why she feels that the baby is always hungry. What signals is he giving her? Is he gaining weight?
  - c) Review her breastfeeding technique.
  - d) Assure her that nearly all women do have sufficient breastmilk.
- 2) While breastfeeding does promote lactation amenorrhoea (not having menses), protection against further infection with HIV or STIs is recommended. It is also important to let her know that breastfeeding is not a reliable form of contraception. If she does not want to become pregnant right away, she needs to use an effective method of contraception. Discuss how she can protect herself and her husband by correctly and consistently using condoms or other barrier methods. Also, use this opportunity to discuss long-term family planning.
- 3) Review signs and symptoms of breast infection and remind Bea that early intervention to maintain her skin intact and prevent future problems is important. Review breast care.

- 4) Assure Bea that if she is exclusively breastfeeding (8–10 times daily), this may be the reason for her fatigue. This is also an emotionally stressful time for both her and her husband with a new baby to care for. Review her diet to ensure that she is consuming adequate calories (500 kcal/day more than she ate before she was pregnant) and eating nutritious foods while breastfeeding. Let her know that you will help link her to HIV care and antiretroviral treatment, when indicated. If it appears her caloric intake is adequate, and she has social support, consider that fatigue may be due to HIV infection and/or an OI. Consider referral for treatment or ask her to tell her HIV provider.
- 5) Her husband sounds burdened by guilt and overwhelmed with his responsibilities. Referring him for professional counselling may be indicated.



## SESSION 3 Treatment, Care, and Support of the Infant and Young Child Exposed to HIV

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### Advance Preparation

For Exercise 7.3: Write on the flipchart the following four categories related to follow-up care for infants or children who are HIV-exposed: HIV testing; Immunisation; Growth and development; and Monitoring for signs/symptoms of HIV infection.

Become familiar with recommended follow-up care for infants and children by reviewing the *Pocket Guide, Module 2, Overview of HIV Prevention in Mothers, Infants, and Young Children*.



**Total Session Time:** 35 minutes

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### Trainer Instructions

**Slides 14 and 15**

Discuss healthcare and support for infants and children exposed to HIV, using the information below.



### Make These Points

- When regular healthcare visits are not possible, the healthcare worker will need to develop strategies to assist the mother with monitoring infant growth and development.
- Refer to national and regional immunisation guidelines in addition to WHO recommendations.

PMTCT interventions reduce, but do not eliminate, the risk of HIV transmission from mother to infant. Regular follow-up care is critical for an infant born to a mother with HIV/AIDS and for an infant whose mother's HIV status is unknown. This includes an infant who has received ARV prophylaxis, because HIV exposure increases an infant's risk of illness and failure to thrive, whether or not the infant has HIV infection.

*Module 6, HIV Testing and Counselling for PMTCT* contains information on HIV testing and diagnosis for infants and young children. The timing of testing and methods used vary according to infant-feeding practices and availability of specific tests.

## Regular visits for health assessment and health promotion

To ensure that infants receive essential care, adequate nutrition, and support for feeding, the newborn should be seen in the healthcare facility or at home. The schedule for healthcare visits should be in accordance with national policy or as suggested below:

- If the infant was born at home, an assessment at the time of delivery followed by a visit in 7 days to monitor feeding progress is strongly advised. Special considerations apply when the infant is receiving ARV prophylaxis. (See Appendix 3-A.)
- It is recommended that subsequent visits be scheduled to coincide with a country's recommended schedule for immunisations. WHO recommends subsequent visits as follows:
  - At ages 6, 10, and 14 weeks
  - Once a month from 14 weeks to 1 year
  - Every 3 months from the ages of 1 to 2

Anytime the infant becomes ill or the mother suspects a problem, seeking early medical intervention is strongly encouraged.

## Immunisation

Infants born to mothers who are HIV-infected should be immunised according to national or local guidelines. Please refer to WHO immunisation recommendations (Appendix 7-E).

## Nutrition and infant-feeding support

As discussed in *Module 4, Infant Feeding in the Context of HIV Infection*, at each visit, workers should assess and support a mother's choice about infant feeding. Discussions about infant feeding are especially important in the early months of life and as new foods are introduced.

Infants who fail to grow require special attention. Workers should assess feeding practices and diet for infants older than 6 months and provide appropriate counselling that considers locally available food, family circumstances and feeding customs. Underlying infections should be treated immediately or ruled out as a cause of growth failure.



## Trainer Instructions

Slides 16, 17, and 18

Discuss follow-up care for infants and children who are HIV-exposed, including the concept of failure to thrive and the importance of monitoring growth and development, especially in the first 2 years of life.



## Make These Points

- Education about early signs and symptoms of both HIV- and non-HIV related conditions may help avoid serious outcomes for the infant.
- Acute diarrhoea is a potentially life-threatening condition in young infants and must be reported and treated as soon as possible.
- Integrated Management of Childhood Illness (IMCI) provides guidance to healthcare providers regarding provision of treatment.

Each visit with the healthcare worker should include the following:

- Assess for common illnesses and manage appropriately as directed by the Integrated Management of Childhood Illness (IMCI) guidelines.
- Identify non-specific symptoms or conditions that could be related to HIV infection using the HIV-adapted IMCI algorithms if available.
- Provide HIV testing as indicated in *Module 6, HIV Testing and Counselling for PMTCT*.
- Provide PCP prophylaxis based on WHO guidelines (Appendix 7-C) or national policies.
- Promote health and prevention of illness.
  - Monitor growth and assess causes of growth failure, if observed.
  - Check immunisation status and immunise as indicated (Appendix 7-E).
  - Provide PCP prophylaxis.
  - Treat for helminth infection if the parasite load in the environment is high or as recommended by IMCI guidelines.
  - Screen, provide prophylaxis for, or treat TB if indicated.
- Prevent and treat malaria, as indicated based on national policy or guidelines.
- Treat anaemia, as indicated based on national policy or guidelines.
- Counsel caregivers on infant feeding, nutrition, ARV treatment when indicated and other care as appropriate.
- Ensure that the mother has access to family planning and support for her own health.

Because the health of mother and child is so closely related, assessment of maternal health and nutrition should be concurrent with assessment of the infant and appropriate referrals for maternal care should be given during infant checkups.



## Trainer Instructions

Slides 19 and 20

Using the content on the next page, discuss prevention of PCP infection.



## Make These Points

- PCP prophylaxis is indicated for infants who are HIV-exposed until they are tested and found to be HIV-negative.
- Refer to national and local policies on PCP prophylaxis in infants.

## Prevention of PCP infection

PCP is a leading cause of death in young infants with HIV. Every infant born to a mother with HIV infection should receive cotrimoxazole to prevent PCP, beginning at 6 weeks and continuing at least through 6 months of age, unless a viral assay shows the infant has no HIV infection. PCP prophylaxis should continue in infants who are HIV-exposed until they are 1 year old or virologic testing shows the infant is not infected (see Appendix 7-C).

## HIV testing

ARV prophylaxis reduces, but does not eliminate, MTCT. Therefore, services must be identified or developed to provide follow-up care and HIV diagnostics to infants of mothers who are HIV-infected and appropriate treatment offered when indicated. Infants of breastfeeding mothers who are HIV-infected are at increased risk for acquiring HIV after birth; the greatest risk of transmission is believed to occur within the first months of life. *Module 6, HIV Testing and Counselling for PMTCT*, discusses laboratory assessment of infants who are HIV-exposed.



## Trainer Instructions

Discuss presentation and assessment of HIV in infants and children, using the information below.



## Make These Points

- ARV prophylaxis reduces MTCT, however, infants who are HIV-exposed require diagnostic testing and close monitoring to determine their HIV status.
- Mothers who are HIV-infected and continue to breastfeed their infants increase the cumulative risk of MTCT over time.
- Recognising symptoms of HIV in infants can help mothers access early treatment for themselves and their infants.
- Supportive counselling must be provided to parents receiving notice of an infant's positive HIV test.

## Clinical presentation and assessment of an infant born to a mother who is HIV-infected

An infant born to a mother who is HIV-infected and presents with symptoms of illness should be assessed using the IMCI guidelines as adapted for areas with a high prevalence of HIV infection.

The signs and symptoms most commonly associated with HIV infection in infants are low weight and/or growth failure; pneumonia, including PCP; oral candidiasis (thrush); lymphadenopathy; parotid gland swelling; recurrent ear infections; persistent diarrhoea, and TB (Table 7.1). Healthcare workers should teach mothers and other caregivers to recognise early signs of those conditions and to seek early care for the child.

Interventions to relieve symptoms, such as oral rehydration for acute diarrhoea, nutritional interventions to promote weight gain, PCP prophylaxis, and screening for TB, are important strategies for improving the health of infants who are HIV-infected.

**Table 7.1. Clinical conditions or signs of HIV infection in a child who is HIV-exposed**

Specificity for HIV infection	Signs and conditions
Common in children who are HIV-infected; also seen in ill, uninfected children	<ul style="list-style-type: none"> <li>▪ Chronic, recurrent otitis media with discharge</li> <li>▪ Persistent or recurrent diarrhoea</li> <li>▪ Failure to thrive</li> <li>▪ Tuberculosis</li> </ul>
Common in children who are HIV-infected; uncommon in uninfected children	<ul style="list-style-type: none"> <li>▪ Severe bacterial infections, particularly if recurrent</li> <li>▪ Persistent or recurrent oral thrush</li> <li>▪ Chronic parotitis (often painless)</li> <li>▪ Generalised persistent noninguinal lymphadenopathy in two or more sites</li> <li>▪ Hepatosplenomegaly</li> <li>▪ Persistent or recurrent fever</li> <li>▪ Neurologic dysfunction</li> <li>▪ Herpes zoster (shingles), single dermatome</li> <li>▪ Persistent generalised dermatitis unresponsive to treatment</li> </ul>
Specific to HIV infection	<ul style="list-style-type: none"> <li>▪ <i>Pneumocystis carinii</i> pneumonia</li> <li>▪ Oesophageal candidiasis</li> <li>▪ Lymphoid interstitial pneumonitis</li> <li>▪ Herpes zoster (shingles) with multidermatomal involvement</li> <li>▪ Kaposi's sarcoma</li> </ul>



## Trainer Instructions

### Slides 21 and 22

Discuss caring for infants who are HIV-infected and integrating HIV paediatric care into ongoing care. Introduce the concept of paediatric ARV treatment, using the information below.



### Make These Points

- Review WHO recommendations for ARV treatment and refer to national and local policies.
- Family beliefs play an important role in determining initiation of and adherence to antiretroviral treatment regimens when an infant is HIV-infected.

### Care of the infant with documented HIV infection

The suspicion or confirmation of HIV diagnosis in an infant or child is difficult for the parents. Workers should discuss the diagnosis compassionately and confidentially, and they should offer the parents information about services available for the child (see *Module 6, HIV Testing and Counselling for PMTCT*, Appendix 6-B).

### Integrating the care of infants who are HIV-infected into ongoing care using IMCI

Several countries have adapted guidelines, including those outlined in IMCI, to include recognition of the special needs of children with HIV infection and to help healthcare workers assess and provide better management when HIV is suspected or confirmed. Adhering to guidelines may help integrate the care of children with symptomatic HIV infection into MCH services.

### Antiretroviral treatment

Where ARV treatment is available, healthcare workers must monitor infants and children (considering laboratory findings, when available) for symptoms of HIV infection that would make them candidates for ARV treatment, and refer them for appropriate HIV treatment and care.

Before treatment begins, healthcare workers need to assess a family's beliefs about drugs and treatment, the family's readiness to begin treatment, and their ability to follow a dosing schedule. Treatment decisions follow international and national policies and guidelines.

When CD4 cell assays are available the use of the CD4 cell percentage is recommended for decision-making on ARV treatment rather than the absolute CD4 cell count, because the former varies less with age.

**For infants who are seropositive aged less than 18 months, WHO recommends the initiation of ARV therapy in the following circumstances:**

The infant has virologically proven infection (using either HIV DNA PCR, HIV RNA assay, or immune-complex dissociated p24 antigen) and has:

- WHO Paediatric Stage III HIV disease (ie clinical AIDS) irrespective of CD4%; or
- WHO Paediatric Stage II HIV disease, with consideration of using CD4 <20% to assist in decision-making; or
- WHO Paediatric Stage I (ie, asymptomatic) and CD4% <20%. (asymptomatic children, ie, WHO Stage I, should only be treated when there is access to CD4 assays).

If virological tests to confirm HIV infection status are not available but CD4 cell assays are available, WHO recommends that ARV treatment can be initiated in infants who are HIV-seropositive and have WHO Stage II or III disease and a CD4 percentage below 20%. In such cases, HIV antibody testing must be repeated at age 18 months in order to definitively confirm that the children are HIV-infected; ARV therapy should only be continued in infants with confirmed infection.

**For children who are HIV-seropositive aged 18 months or older, WHO recommends initiation of ARV therapy in the following circumstances:**

- WHO Paediatric Stage III HIV disease (clinical AIDS), irrespective of CD4%; or
- WHO Paediatric Stage II disease, with consideration of using CD4 <15% to assist in decision-making; or
- WHO Paediatric Stage I (asymptomatic) and CD4 <15%.

Breastfed infants are at risk of HIV infection during the entire period of breast-feeding. A negative virological or antibody test at one age does not exclude the possibility of infection occurring subsequently if breastfeeding continues.



## Trainer Instructions

Lead participants through the following exercise, which will provide information on monitoring for signs and symptoms in infants who HIV-infected.

<b>Exercise 7.3: Clinical presentation of HIV in infants</b>	
<b>Purpose</b>	To familiarise participants with the signs and common conditions in infants who are HIV-infected.
<b>Duration</b>	20 minutes
<b>Introduction</b>	<p>Consider the following 4 categories as they relate to follow-up of infants and children who are HIV-exposed:</p> <ul style="list-style-type: none"> <li>▪ HIV testing</li> <li>▪ Immunisation</li> <li>▪ Growth and development</li> <li>▪ Monitoring for signs and symptoms of HIV</li> </ul> <p>This exercise will focus on the last category, monitoring for signs and symptoms of HIV.</p>
<b>Activity</b>	<ul style="list-style-type: none"> <li>▪ Begin new page on flipchart and write: "Signs/symptoms of HIV infection in infants and children."</li> <li>▪ Ask participants what they think is the most common presenting sign of HIV infection in an infant or child. If they need a clue, say "This relates to general appearance." Answers: <ul style="list-style-type: none"> <li>▪ Being underweight</li> <li>▪ Being small for their age</li> <li>▪ Failure to thrive</li> </ul> </li> <li>▪ Record participants' responses on flipchart.</li> <li>▪ Ask the group to identify which body systems or organs may be involved in early presentation of HIV infection. Answers: <ul style="list-style-type: none"> <li>▪ Organs: lymph, liver, spleen, lungs</li> <li>▪ Systems: GI, neurologic, dermatologic, immune</li> </ul> </li> <li>▪ Record participants' responses on flipchart.</li> <li>▪ Divide participants into three groups and assign one card to each group with the following headings (one per card): GI, Pulmonary, Immune Function.</li> <li>▪ Ask each group to list on their cards symptoms indicating HIV infection related to their card heading.</li> <li>▪ Ask each group to determine if this symptom is HIV-specific and what their recommendation for next steps would be (including prophylaxis).</li> <li>▪ Ask one spokesperson from each group to record on the flipchart their list of symptoms and treatment recommendations.</li> <li>▪ Review the clinical conditions or signs in Table 7-1 and discuss any conditions the group did not mention.</li> </ul>
<b>Debriefing</b>	Stress to participants that educating mothers to recognise early symptoms of HIV infection and seek medical care immediately can prevent complications and even death.





## Trainer Instructions

Slides 23, 24 and 25

Discuss the key points, using the information below.

### Module 7: Key Points

- A continuum of care is provided through linkages between PMTCT, MCH and available HIV treatment, care, and support services, including those offered by NGO and FBO groups in the community.
- Linkages to NGOs and FBOs may help families living with HIV/AIDS gain access to social support and assistance with specific needs such as housing, transportation, food, and income-generating activities.
- Postpartum care includes clinical assessment, infant-feeding support, family planning, and referral for HIV-related treatment and care.
- Infants who are HIV-exposed require follow-up care to monitor growth and development, immunisations, and prophylaxis for infections. They also require testing to determine HIV status.
- IMCI guidelines may help healthcare workers integrate care for children who are HIV-exposed or HIV-infected into ongoing MCH services.
- PMTCT-Plus programmes provide linkages to antiretroviral treatment for mothers who are HIV-infected, their children, and other family members.
- Timing of testing and diagnosis of HIV infection in infants and young children varies according to feeding practices and available tests.

## APPENDIX 7-A Tuberculosis (TB)

### Background

HIV infection leads to increased susceptibility to TB, promotes progression of recent and latent *Mycobacterium tuberculosis* infection to active TB disease, increases the risk of recurrence, and complicates the clinical course of TB disease. TB is cited as the leading cause of death among persons who are HIV-infected; an estimated 40% of PLWHA acquire TB during their lifetime.

In sub-Saharan Africa, up to 70% of patients with pulmonary TB are HIV-infected. TB prevention, screening, care, and treatment are becoming priority concerns in patients who are HIV-infected; prevention, screening, care, and treatment of HIV/AIDS are priority concerns in patients with TB.

### Case Detection

Cough is the most common symptom of pulmonary TB. All patients referred to a health facility, irrespective of their HIV status, with a cough lasting 2–3 weeks should be screened for TB. Other TB symptoms include:

- Fever
- Haemoptysis
- Weight loss
- Chest pain
- Fatigue

### BCG Vaccine

Bacille Calmette-Guerin (BCG) is a live attenuated vaccine given intradermally to protect young children against severe TB. The usual dose is 0.05 ml in neonates and infants under 3 months of age, and 0.1 ml in older children.

*WHO's policy regarding this vaccine states that BCG should not be given to children with symptomatic HIV infection (ie AIDS). In asymptomatic children, the decision to give BCG should be based on the local risk of tuberculosis:*

- Where the risk of tuberculosis is high, BCG is recommended at birth or as soon as possible thereafter, in accordance with standard policies for immunisation of children who are not HIV-infected;
- In areas where the risk of tuberculosis is low but BCG is recommended as a routine immunisation, BCG should be withheld from individuals known or suspected to be infected with HIV.

### Treatment

Treatment protocols for both active and latent TB are standardised. In each country, guidance is provided on screening, treatment, and monitoring of the patient with TB. Prophylaxis against TB should be part of a package of care for people living with HIV/AIDS. This prophylaxis is recommended for individuals who are HIV-infected and test positive for TB infection, and those in whom active TB has been excluded.

## APPENDIX 7-A Tuberculosis (TB) *(continued)*

Prophylaxis may also be considered for individuals who are HIV-infected and living in a community with a high prevalence of TB infection, where skin testing is unavailable. Six to nine months of isoniazid (INH) is the regimen recommended for preventive treatment of latent TB infection.

Patients who are HIV-infected and who have active TB should also receive cotrimoxazole therapy to prevent secondary bacterial and parasitic infections.

When selecting drugs to treat TB, women taking oral contraceptives, pregnant women, and patients who are HIV-infected and receiving ART require special consideration. With careful clinical management, however, patients with HIV-related TB can receive simultaneous TB and HIV treatment. The revised (2003) WHO guidelines, *Scaling up antiretroviral therapy in resource-limited settings: treatment guidelines for a public health approach*, provide up-to-date information on ARV therapy for the special category of patients who are receiving concomitant TB treatment.

In primary care settings and PMTCT programmes healthcare workers can play an active role in TB screening, as well as in treatment or referral for treatment and monitoring of patients with TB and HIV.

Adapted from WHO. 2004. *Scaling up antiretroviral therapy in resource-limited settings: Treatment guidelines for a public health approach*. WHO: Geneva. Retrieved 30 July 2004, from <http://www.who.int/hiv/pub/mtct/en/arvdrugsguidelines.pdf>

## APPENDIX 7-B Community resource information worksheet

Use this form to list the contact information for agencies that provide services to families living with HIV/AIDS.

COMMUNITY RESOURCES THAT SUPPORT THE PMTCT PROGRAMME		
Resource Category	We Have	We Need
Voluntary testing and counselling for partners		
Health care (STIs, reproductive health, TB treatment, etc.)		
HIV/AIDS care and ARV treatment		
Nutritional support		
Support group or club		
Community-based AIDS service and faith-based organisations		

## APPENDIX 7-C *Pneumocystis carinii* pneumonia prophylaxis in adults and infants

Note: Revised recommendations for HIV care in resource-constrained settings are in development. Once these are finalised, the content in this section will be updated to reflect these recommendations.

Category	Recommendation for Adults
Client selection and duration of prophylaxis	<ul style="list-style-type: none"> <li>All persons with symptomatic HIV (WHO Stage II, III, IV)</li> <li>Asymptomatic individuals with CD4 counts below 500/mm<sup>3</sup> or equivalent total lymphocyte count</li> <li>Cotrimoxazole should be taken for life or until ARV agents become available and therapy results in restoration of CD4 count of 500/mm<sup>3</sup> or higher</li> </ul>
Drug regimen	<ul style="list-style-type: none"> <li>Recommended dose: cotrimoxazole 960 mg once daily (1 double-strength tablet or 2 single-strength tablets daily)</li> </ul>
Preparation	<ul style="list-style-type: none"> <li>Most commonly, oral tablet</li> </ul>
Adverse events requiring discontinuation and substitution	<ul style="list-style-type: none"> <li>Severe cutaneous reaction, such as fixed drug reaction or Stevens-Johnson syndrome; renal or hepatic insufficiency; severe haematologic toxicity</li> </ul>
Category	Recommendation for Infants who are HIV-Exposed
Client selection and duration of prophylaxis	<ul style="list-style-type: none"> <li>Infants who have been exposed to HIV, starting at 6 weeks and continuing for at least 6 months, preferably until HIV infection can be ruled out</li> <li>Infants less than age 12 months, who are HIV-infected, regardless of symptoms or CD4 count</li> <li>Infants more than 12 months of age, who are in primary care settings and PMTCT programmes, if symptomatic; if AIDS is diagnosed; if CD4 is below 15% (when information is available); or prior PCP diagnosis</li> </ul>
Drug regimen	<ul style="list-style-type: none"> <li>Trimethoprim (TMP) 150 mg/m<sup>2</sup> and sulfamethoxazole (SMX) 750 mg/m<sup>2</sup> once daily</li> </ul>
Preparations	<ul style="list-style-type: none"> <li>Oral suspension: TMP 8 mg/mL and SMX 40 mg/mL</li> <li>If suspension is unavailable, crushed tablets may be used</li> </ul>
Adverse events requiring discontinuation and substitution	<ul style="list-style-type: none"> <li>Severe cutaneous reaction such as fixed drug reaction or Stevens-Johnson syndrome, renal or hepatic insufficiency; severe haematologic toxicity</li> </ul>
<p><b>FOR AN EXPLANATION OF THE WHO STAGING OF HIV, SEE APPENDIX 1-A.</b>            Adapted from: World Health Organisation (WHO). 2003. <i>A Reference Guide on HIV-Related Care, Treatment, and Support of HIV-Infected Women and Their Children in Resource Constrained Settings</i>. WHO: Geneva [Draft].</p>	

## APPENDIX 7-D Suggestions to maximise food intake for PLWHA

Symptom	Suggested Strategy
Fever and loss of appetite	<ul style="list-style-type: none"> <li>▪ Drink high-energy, high-protein liquids, fruit juices.</li> <li>▪ Throughout the day, eat small portions of preferred soft foods with a pleasant aroma and texture.</li> <li>▪ Eat nutritious snacks whenever possible.</li> <li>▪ Drink liquids often.</li> </ul>
Sore mouth and throat	<ul style="list-style-type: none"> <li>▪ Avoid citrus fruits, tomatoes, spicy foods.</li> <li>▪ Avoid very sweet foods.</li> <li>▪ Drink high-energy, high-protein liquids with a straw, if available.</li> <li>▪ Eat foods at room temperature or cooler.</li> <li>▪ Eat thick, smooth foods such as pudding, porridge, mashed potato, mashed carrot or other non-acidic vegetables and fruits.</li> </ul>
Nausea and vomiting	<ul style="list-style-type: none"> <li>▪ Eat small snacks throughout the day and avoid large meals.</li> <li>▪ Eat toast and other plain, dry foods.</li> <li>▪ Avoid foods that have a strong aroma.</li> <li>▪ Drink diluted fruit juices, other liquids, soup.</li> <li>▪ Eat simple boiled foods, such as porridge, potato, beans.</li> </ul>
Loose bowels	<ul style="list-style-type: none"> <li>▪ Eat bananas, mashed fruits, soft rice, porridge.</li> <li>▪ Eat smaller meals, more often.</li> <li>▪ Eliminate dairy products to see if they are the cause.</li> <li>▪ Decrease high-fat foods.</li> <li>▪ Avoid foods with insoluble fibre ("roughage").</li> <li>▪ Drink liquids often.</li> </ul>
Fat malabsorption	<ul style="list-style-type: none"> <li>▪ Eliminate oils, butter, margarine and foods that contain or are prepared with them</li> <li>▪ Eat only lean meats.</li> <li>▪ Eat fruit, vegetables, other low-fat foods.</li> </ul>
Severe diarrhoea	<ul style="list-style-type: none"> <li>▪ Drink liquids frequently.</li> <li>▪ Drink oral rehydration solution.</li> <li>▪ Drink diluted juices.</li> <li>▪ Eat bananas, mashed fruits, soft rice, porridge.</li> </ul>
Fatigue and lethargy	<ul style="list-style-type: none"> <li>▪ Have someone precook foods to save energy and time spent in preparation.</li> <li>▪ Eat fresh fruits that don't require preparation.</li> <li>▪ Eat snack foods often throughout the day.</li> <li>▪ Drink high-energy, high-protein liquids.</li> <li>▪ Set aside time each day for eating.</li> </ul>
Woods, MN: 1999. Dietary recommendations for the HIV/AIDS patient. In: <i>Nutritional Aspects of HIV Infection</i> , ed. T. Miller and SL. Gorbach, Arnold Press, London. pp 191–203.	

## APPENDIX 7-E WHO immunisation recommendations<sup>1</sup>

Age of Infant	Vaccine
Birth	BCG*, OPV-0
6 weeks	DPT-1, OPV-1
10 weeks	DPT-2, OPV-2
14 weeks	DPT-3, OPV-3
9 months <sup>2</sup>	Measles <sup>2</sup>

### Key:

BCG = Bacille Calmette Guerin

OPV = oral polio vaccine

DPT = diphtheria, pertussis, tetanus

<sup>1</sup> Additional immunisations, for yellow fever or other diseases, for example, may be included in national recommendations that account for local disease prevalence.

<sup>2</sup> An additional, early dose of measles vaccine should be given at age 6 months if the following conditions are met:

- Measles morbidity and mortality before age 9 months represents more than 15% of cases and deaths.
- There is a measles outbreak.
- The infant has a high risk of measles death. This includes infants:
  - with documented HIV infection
  - living in refugee camps
  - admitted to the hospital or
  - affected by disasters

\* BCG—do not give in low prevalence countries to infants or children who are HIV-infected; in high prevalence countries give to all children except children with symptoms of HIV/AIDS.

All children who have been exposed to HIV should be fully immunised according to their age. Because most children who are HIV-infected do not have severe immune suppression during the first year of life, immunisation should occur as early as possible after the recommended age to optimise the immune response.

**BCG and yellow fever.** Children with known symptomatic HIV infection should not receive BCG and yellow fever vaccines. However, because most infants who are HIV-infected are asymptomatic at birth, when BCG immunisation occurs, and thus will have unknown HIV status, the birth BCG immunisation should be given.

**Oral polio vaccine.** If the child has diarrhoea and is scheduled to receive OPV, the dose should be given as scheduled. However, the dose should not be counted in the schedule, and an additional dose of OPV should be given after the diarrhoea has resolved.

**Diphtheria, pertussis, tetanus.** Children who have either recurrent convulsions or active central nervous system disease or who have had shock or convulsions within 3 days of receiving a DPT vaccination should not receive subsequent DPT vaccination. For those children, substitute DT (diphtheria–tetanus) formulation; all other immunisations may be given.

## APPENDIX 7-E WHO immunisation recommendations *(continued)*

**Hepatitis B vaccine.** WHO recommends that the hepatitis B vaccine be included in routine childhood immunisation schedules for all children in all countries. Give the hepatitis B vaccine according to any of the following schedules:

- *Option 1:* Give hepatitis B vaccine at 6, 10, and 14 weeks (3 doses), to coincide with the DPT schedule. The disadvantage of this option is that it does not protect against perinatal hepatitis B infection.
- *Option 2:* Give hepatitis B vaccine at BIRTH, 6, and 14 weeks (3 doses); the last two doses coincide with the 1<sup>st</sup> and 3<sup>rd</sup> doses of the DPT schedule.
- *Option 3:* Give hepatitis B vaccine at BIRTH, 6, 10, and 14 weeks (4 doses); the last three doses coincide with the DPT schedule.

Options 2 or 3 are preferred for countries with high prevalence of maternal HIV and with a high rate of perinatal hepatitis B transmission. The 3-dose schedule (Option 2) is less expensive, but may be more complicated to administer, because the immunisation schedule differs for the 6-, 10-, and 14-week well baby visits. Whereas, the 4-dose schedule (Option 3) may be easier to administer in practice, but is more costly, and vaccine supply issues may make it unfeasible.

**Haemophilus influenzae type B.** Vaccinate at 6, 10, and 14 weeks. In some areas a booster at 12 to 18 months is recommended, if available.

*Sources:* Adapted from WHO, Department of Vaccines and Biologicals. 2001. *Introduction of hepatitis B vaccine into childhood immunization services. Management guidelines, including information for health workers and parents.* Retrieved 30 July 2004, from [www.who.int/vaccines-documents/DocsPDF01/www613.pdf](http://www.who.int/vaccines-documents/DocsPDF01/www613.pdf)

WHO, Department of Vaccines and Biologicals. 2000. *Introduction of haemophilus influenzae type B vaccine into immunization programmes: Management guidelines, including information for health workers and parents.* Retrieved 30 July 2004, from <http://www.who.int/vaccines-documents/DocsPDF99/www9940.pdf>